

# Notice of Allowability

Application No.

09/807,867

Examiner

Russell Kallis

Applicant(s)

CAROL ET AL.

Art Unit

1638

## -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to amendment filed 6/17/2004.
2. ☒ The allowed claim(s) is/are 14, 15, 20, 25, 30 and 31 (renumbered 1-6).
3. ☒ The drawings filed on 20 April 2001 and 20 July 2001 are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☒ All b) ☐ Some\* c) ☐ None of the:
    1. ☐ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☒ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
  6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
    - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
    - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

### Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date \_\_\_\_\_
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☒ Interview Summary (PTO-413), Paper No./Mail Date 12/02/2004.
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_.

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A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 6/17/2004 has been entered.

#### **EXAMINER'S AMENDMENT**

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Melanie McCollum on 12/08/2004.

The application has been amended as follows:

In the specification:

On Page 2, line 35, change "3" to --5-- and "4" to --3--.

In the claims:

Claims 21, 24, 26 and 29 are canceled. Claims 30 and 31 are added.

Claim 14 (currently amended) A [P]process for modifying the production of carotenoids in a plant, by increasing the production of carotenoids relative to the normal content of carotenoids produced by the plant, said process comprising transformation of cells of said plant[s] with a vector [adapted to increase carotenoid biosynthesis, said vector] comprising: [a nucleotide sequence encoding]

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(1) a nucleotide sequence encoding an enzyme having terminal oxidase activity involved in carotenoid biosynthesis, said enzyme comprising [represented by] SEQ ID NO: 2, or

(2) [a protein having equivalent enzymatic activity to the enzyme] a nucleotide sequence having at least 70% sequence identity to SEQ ID NO: 1 and encoding an enzyme having terminal oxidase activity involved in carotenoid biosynthesis [represented by SEQ ID NO: 2],

wherein said nucleotide sequence [being preceded by] is operably linked to a promoter, such that the vector can generate mRNA in the plant cells, and [wherein] the production of carotenoids in said plant is increased.

Claim 15 (currently amended) A [P]process for producing carotenoids in a plant cell, or eukaryotic or prokaryotic cell, said process comprising transformation of at least one plant, eukaryotic or prokaryotic cell with a vector [adapted to increase carotenoid biosynthesis, said vector] comprising: [a nucleotide sequence encoding]

(1) a nucleotide sequence encoding an enzyme having terminal oxidase activity involved in carotenoid biosynthesis, said enzyme comprising [represented by] SEQ ID NO: 2, or

(2) [a protein having equivalent enzymatic activity to the enzyme] a nucleotide sequence having at least 70% sequence identity to SEQ ID NO: 1 and encoding an enzyme having terminal oxidase activity involved in carotenoid biosynthesis [represented by SEQ ID NO: 2],

wherein said nucleotide sequence [being preceded by] is operably linked to a promoter, such that the vector can generate mRNA in said at least one cell, and [wherein] the production of carotenoids in said plant, eukaryotic or prokaryotic cell is increased.

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Claim 30 (new) The process according to claim 14, wherein said vector comprises a nucleotide sequence having at least 80% sequence identity to SEQ ID NO: 1 and encoding an enzyme having terminal oxidase activity involved in carotenoid biosynthesis.

Claim (31) (new) The process according to claim 15, wherein said vector comprises a nucleotide sequence having at least 80% sequence identity to SEQ ID NO: 1 and encoding an enzyme having terminal oxidase activity involved in carotenoid biosynthesis.

The following is an examiner's statement of reasons for allowance: Claims 14-15, 20 and 25 are deemed free of the prior art given the failure of the prior art to teach or reasonably suggest a method of modifying the production of carotenoids in a plant cell , or a eukaryotic or prokaryotic cell, or a plant by transformation with a polynucleotide encoding SEQ ID NO: 2 or a polynucleotide having 70% sequence identity to SEQ ID NO: 1; and in further view of Applicant's teaching of polynucleotides encoding three terminal oxidase enzymes of carotenoid biosynthesis (TOCB), from broadly divergent species comprising two from new world plants pepper and tomato of the *Solanaceae* family and a TOCB from *Arabidopsis* of the *Brassicaceae*, an old world plant.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Russell Kallis whose telephone number is (571) 272-0798. The examiner can normally be reached on M-F 8:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amy Nelson can be reached on (571) 272-0804. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Russell Kallis Ph.D.  
December 6, 2004

DAVID T. FOX  
PRIMARY EXAMINER  
GROUP 180/1638

*Received 7/4*